

A NEW APHID FROM FLORIDA.

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Carolinaia cyperi, n. sp.

Alate viviparous female—General colour black. Head, thorax and abdomen shining black, the latter with a greenish tinge in strong light. Eyes dark red, almost black. Antennæ black, appearing brownish in strong light, shorter than body, reaching beyond middle of abdomen, situated on very flat frontal tubercles, 6-segmented. Antennal segment VI with basal portion less than half as long as spur and shorter than IV, III about two-thirds as long as spur, five to seven, generally six, large round sensoria in a row on III, the usual ones at tip of IV and at base of spur. Rostrum dusky yellow, short, reaching just beyond first coxæ. Wings hyaline with strong black veins, stigma dusky, articulation greenish, venation of fore wings regular, hind wings with but one cross vein. Legs dusky yellow, tarsi and distal extremities of femora and tibiæ black. Cornicles dusky yellow, sometimes with reddish tinge, robust, swollen on inner side, largest about two-thirds out from base, with a sharp constriction and a flaring ring at tip which is turned slightly outward, carried closely appressed to the body pointing toward the cauda. Cauda dusky yellow, conical, retracted in life.

Measurements—Length of body 1.40 mm., width .65 mm. Length of antennal segments: I .071 mm., II .053 mm., III .212-.265, aver. .245 mm., IV .141-.177, aver. .157 mm., V .159-.194, aver. .177 mm., VI base, .123-.159, aver. .147 mm., spur, .335-.406, aver. .378 mm. (averages from ten antennæ). Total length 1.213 mm. Wings, fore wing, length 2.29 mm., width .84 mm., hind wing, length 1.21 mm., width .33 mm., total wing expanse 5.15 mm. Cornicle, length .212 mm., width .053 mm. Cauda, length .106 mm.

Apterous viviparous female—General colour black with a sepia tinge and shining with a metallic lustre. Surface of head, thorax and abdomen minutely rugose or shagreened. Body flattened, turtle-shaped, with lateral margins prominent and often furrowed. Antennæ 6-segmented, I, II, V and VI dark with yellowish tinge, III and IV paler, the articulation between III and IV though

sometimes not complete is always indicated, a single sensorium near tip of IV and the usual group at base of spur. Legs dusky yellow, tarsi and distal extremities of femora of second and third pairs darker. Cornicles and cauda as in alate form, the former closely appressed to the abdomen in life.

Measurements—Length of body 1.63 mm., width .93 mm. Length of antennal segments, I .07 mm., II .05 mm., III .14-.176, aver. .16 mm., IV .088-.124, aver. .10 mm., V .106-.124, aver. .12 mm., VI base .088-.106, aver. .10 mm., spur .212-.247, aver. .23 mm., total length .839 mm. Cornicles, length .265 mm. Cauda, length .088 mm.

Pupa—Head, thorax and abdomen dark mottled green. Antennæ dusky yellow at base, shading to almost black at tip. Eyes dark red. Wing pads pale yellow with greenish tinge. Legs pale yellow. Cornicles as in alate form, though more robust. Cauda not apparent. Length of body 1.26 mm., width .79 mm.

The young are pale yellow or greenish when born and gradually darken as they approach maturity.

The species agrees well with Wilson's definition of the genus, except that the apterous forms have indistinctly 6-segmented antennæ instead of 5-segmented as he gives it. The division between III and IV is plainly indicated in all the specimens I have seen and in many is complete.

This aphid was first found at Lakeland, Florida, in November, 1912. Further observations were made during the following winter and during the winter of 1913-14. Specimens were sent to Mr. J. J. Davis and Mr. J. T. Monell, both of whom pronounced it a new species of *Carolinia*. I am indebted to them and especially to Mr. J. J. Davis for assistance in the preparation of this paper.

The species appears to be rather generally distributed throughout Florida, for it has been taken at a number of places throughout the state and as far north as Gainesville. *Cyperus esculentus*, which in its wild form is the pestiferous nut-grass of the south and in cultivation is known as the chufa, is its only observed food plant. It thrives on chufa in cages and colonizes it readily when available in the field. Other species of *Cyperus* growing in close proximity to infested plants of *esculentus* were examined repeatedly, but the aphid was never found on them.

Notwithstanding its dark colour, it is a very inconspicuous species, for it lives only on the under side of the leaves, where it forms large colonies, the apterous adults lying in a single regular row on each side of the midrib with the small forms crowded in among them. It is surprising how many can exist in this way on the lower side of one leaf. No matter how crowded they may be on the under surface, they never feed on the upper surface, and the leaves seem never to show the slightest effect of their presence. The alate forms are very seldom found in the larger colonies, for they leave the group as soon as matured to establish new ones on uninfested plants.

It has not been followed throughout an entire season. When first found in November the colonies, then rather small, consisted of apterous adults, young, and an occasional alate form. In January almost every plant in the field bore large colonies, but winged adults were very scarce. When, however, some of the infested plants were transferred to a cage, winged forms appeared at once, indicating that they had been developing, but leaving the parent colony as soon as mature. The large colonies persisted in the field and became very abundant until about the middle of March, when predaceous enemies began to make serious inroads upon them. Previous to this the weather, while not freezing, had been cool enough to suppress most insect activity. From this time on the colonies grew smaller and more scattered, for Coccinellids and Syrphids became so numerous that no colony long remained unmolested. Small scattering colonies were still present at the time of my last observations late in May. No sexes have been found, and it is most likely that the species can winter exposed on its food plant in any normal season. In evidence of this, I have just received a letter from Mr. R. N. Wilson from Gainesville, Florida, dated November 27, 1914, in which he states that a recent cold snap froze the nut-grass back to the ground, and that the aphids are not numerous, but at the same time he sent a good supply of them taken in the open. How they fare in summer, when the unshaded sand is heated to 130 to 150 degrees F. by the sun, I have not had opportunity to observe.

Coccinella sanguinea and *Baccha clavata* were the most common of the predaceous enemies though other species of Coccinellids

and Syrphids were present in smaller numbers. Numbers of parasites were reared from the larvæ and pupæ of these predators, among them several undescribed species of Hymenoptera. Internal parasites were not in evidence, and only a few aphids killed by them were seen. Possibly in summer they are more efficient. Aside from insect enemies, the most serious foe of the nut-grass aphid is the hard dashing rain, which becomes more frequent in May and June. The fine sand is driven against the lower surface of the leaves with such force by the splashing rain-drops that most of the aphids are beaten off or killed, and after two or three such showers it is often difficult to find more than a few scattered individuals.

Records of a few individuals more closely observed follow. On January 20 a migrant taken from the field was put on a potted nut-grass plant. While the plant remained fresh apterous adults developed, and by January 31 a number of these were producing young. February 2 the original migrant was still producing young, but the plant had begun to deteriorate. February 11 the plant was practically dead, killed by a larva of *Bactra lanceolana*, so the few aphids remaining were transferred to a fresh plant. February 19 alate forms began to appear, and between that date and April 7, when the plant finally died from neglect, 181 winged forms were removed, practically all that were produced during that period having developed wings.

An alate vivipara maturing January 22 was placed on a caged plant. Up to March 6, when she disappeared, she had given birth to 51 young at the rate of one, two or three per day.

THE SYMMETRY OF INSECTS.

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All insects are bilaterally symmetrical, or, in other words, the two lateral halves of an insect are alike, and symmetry can be defined as a pleasing equality of parts. Bilateral symmetry is sometimes known as horizontal dual symmetry, inasmuch as bilaterally symmetrical objects are usually oriented from a middle point or portion and exploited by equal movements of the eyes to the right and to the left, which is the natural method. As a result,